

WHAT IS CLAIMED IS:

1. A semiconductor device for a receiver having a reference oscillator, wherein the receiver uses a reference  
5 signal generated by the reference oscillator to receive a signal in a predetermined channel bandwidth, the semiconductor device comprising:

a local oscillator for generating a local signal having a local frequency;

10 a PLL controller connected to the local oscillator for controlling the local frequency in accordance with the reference signal to set the channel bandwidth; and

a comparator connected to the local oscillator for comparing frequency of the received signal with frequency of  
15 the reference signal or phase of the received signal with phase of the reference signal and generating an error signal in accordance with the comparison to correct the local frequency.

20 2. The semiconductor device according to claim 1, further comprising:

a demodulator for demodulating the received signal to generate a carrier signal, wherein the comparator compares  
25 frequency of the carrier signal with frequency of the reference signal or phase of the carrier signal with phase of the reference signal to generate the error signal in accordance with the comparison.

3. The semiconductor device according to claim 1,  
30 wherein the receiver is provided with a transmitting function, and the local oscillator functions as a modulator when the receiver transmits a signal.

4. The semiconductor device according to claim 1,  
further comprising:

a signal generator for generating a modulation signal  
having a frequency corresponding to the error signal; and

5 a quadrature modulator connected to the signal  
generator and the local oscillator to modulate the local  
signal with the modulation signal.

5. The semiconductor device according to claim 4,  
10 wherein the receiver is provided with a transmitting  
function, and the quadrature modulator functions as a  
modulator when the receiver transmits a signal.

6. A semiconductor device for a receiver having a  
15 reference oscillator, wherein the receiver uses a reference  
signal generated by the reference oscillator to receive a  
signal in a predetermined channel bandwidth, the  
semiconductor device comprising:

a local oscillator for generating a local signal;

20 a first control loop including the local oscillator for  
controlling a frequency of the local signal based on the  
reference signal to set the channel bandwidth; and

a second control loop including the local oscillator  
for comparing frequency of the received signal with  
25 frequency of the reference signal or phase of the received  
signal with phase of the reference signal and generating an  
error signal in accordance with the comparison to correct  
the local frequency.

30 7. The semiconductor device according to claim 6,  
further comprising:

a loop switching circuit connected to the local  
oscillator to selectively validate the first control loop

and the second control loop, wherein the loop switching circuit invalidates the first control loop and validates the second control loop after setting the channel bandwidth with the first control loop.

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8. The semiconductor device according to claim 6, wherein the receiver includes a band pass filter for setting a channel bandwidth of the received signal, the semiconductor device further comprising:

10 a frequency controller connected to the band pass filter to set a center frequency of the band pass filter to a frequency corresponding to the channel bandwidth in accordance with the reference signal before the second control loop corrects the local frequency.

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9. A semiconductor device for a receiver having a reference oscillator, wherein the receiver uses a reference signal generated by the reference oscillator to receive a signal of a predetermined channel, the semiconductor device comprising:

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a local oscillator for generating a local signal;

a mixer connected to the local oscillator for generating an intermediate frequency signal having a predetermined intermediate frequency with the local signal and the received signal;

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a PLL controller connected to the local oscillator for setting a frequency of the local signal with the reference signal to receive the received signal of the predetermined channel; and

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a comparator connected to the local oscillator for comparing a frequency of the intermediate frequency signal with frequency of the reference signal or phase of the intermediate frequency signal with phase of the reference

signal and generating an error signal in accordance with the comparison to correct the frequency of the local signal.

10. The semiconductor device according to claim 9,  
5 further comprising:

a band pass filter connected to the mixer, wherein the band pass filter has a predetermined passage bandwidth through which the intermediate frequency signal passes; and

a demodulator connected to the band pass filter for  
10 demodulating the intermediate frequency signal to generate a carrier signal, wherein the comparator compares frequency of the carrier signal with frequency of the reference signal or phase of the carrier signal with phase of the reference signal and generates the error signal in accordance with the  
15 comparison to correct the frequency of the local signal.

11. The semiconductor device according to claim 10, further comprising:

a divider connected to the reference oscillator for  
20 dividing the reference signal to generate a divisional reference signal, wherein the comparator compares frequency of the carrier signal with frequency of the divisional reference signal or phase of the carrier signal with phase of the divisional reference signal and generates the error  
25 signal in accordance with the comparison to correct the frequency of the local signal.

12. The semiconductor device according to claim 10, further comprising:

30 a frequency controller connected to the band pass filter and the reference oscillator to set a center frequency of the band pass filter to the intermediate frequency with the reference signal.

13. The semiconductor device according to claim 9,  
further comprising:

5 a switching circuit connected to the local oscillator  
to selectively connected the PLL control circuit and the  
comparator to the local oscillator.

14. The semiconductor device according to claim 9,  
wherein the receiver is provided with a transmitting  
10 function, and the local oscillator functions as a modulator  
when the receiver transmits a signal.

15. A receiver for receiving a signal, the receiver  
comprising:

15 a reference oscillator for generating a reference  
frequency signal having a reference frequency;  
a local oscillator for generating a local signal;  
a band pass filter having a predetermined passage  
bandwidth;  
20 a channel setting circuit connected to the reference  
oscillator and the local oscillator for controlling  
frequency of the local signal in accordance with the  
reference frequency signal and setting the passage bandwidth  
of the band pass filter to a predetermined channel  
25 bandwidth; and  
a frequency correction circuit for comparing frequency  
of the received signal received in the channel bandwidth  
with frequency of the reference signal or phase of the  
received signal with phase of the reference signal and  
30 generating an error signal in accordance with the comparison  
to correct the frequency of the local signal.

16. A method for correcting frequency of a local

signal in a receiver, wherein the receiver includes a reference oscillator for generating a reference signal having a reference frequency, and a band pass filter, the method comprising:

- 5        setting a center frequency of the band pass filter with the reference signal;  
         generating a local signal for receiving a received signal of a predetermined channel with the reference signal;  
         generating an intermediate frequency signal having a  
10        predetermined intermediate frequency with the received signal and the local signal;  
         providing the intermediate frequency signal to the band pass filter;  
         generating an error signal in accordance with a  
15        comparison between frequency of the intermediate frequency signal that passed through the band pass filter and frequency of the reference signal or a comparison between phase of the intermediate frequency signal with phase of the reference signal; and  
20        correcting the frequency of the local signal in accordance with the error signal.

17. The method according to claim 16, wherein said  
25        setting a center frequency includes setting the center frequency to the predetermined intermediate frequency.

18. The method according to claim 17, further comprising:

- 30        generating a carrier signal by demodulating the intermediate frequency signal, wherein said generating an error signal includes comparing frequency of the carrier signal with frequency of the reference signal or phase of the carrier signal with phase of the reference signal to

generate the error signal in accordance with the comparison.

19. The method according to claim 18, further comprising:

5       generating a divisional reference signal by dividing  
the reference signal, wherein said generating an error  
signal includes comparing frequency of the carrier signal  
with frequency of the divisional reference signal or phase  
of the carrier signal with phase of the divisional reference  
10      signal to generate the error signal in accordance with the  
comparison.